

Evaluation of Alternatives

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- ◆ Objective: Compare Alternatives
- ◆ Types of Alternatives
 - Site Location
 - Design for Site
 - Project Size
 - Phasing
 - No-Action vs. Action (Build)
 - Timing

Trade-Off Analysis Matrix

Decision Factor	Alternative			
	1	2	3	4
Meeting Defined Need/Objectives				
Economic Efficiency				
Benefits				
Costs				
Social Impacts				
Socioeconomics				
Cultural Resources				
Visual Resources				
Hazardous Materials				

Trade-Off Analysis (cont.)

Decision Factor	Alternative			
	1	2	3	4
Physical Impacts				
Water Quality/Quantity				
Soils/Geology				
Air Quality				
Noise Levels				
Ecological Impacts				
Terrestrial Systems				
Aquatic Systems				
Wetlands				
Species of Concern				

Approaches to Alternative Evaluation

- ◆ **Qualitative – Descriptive Synthesis**
- ◆ **Quantitative – Numerical Synthesis**
- ◆ **Importance-Weighting Techniques**
 - Ranking – Nominal Group Process
 - Rating – Predefined Importance Scale
 - Paired Comparison
- ◆ **Delphi Technique**

Qualitative - Descriptive Synthesis

Decision factor	Alternative		
	A1	A2	A3
F1	Achieves 95% of identified needs and objectives.	Achieves 70% of identified needs and objectives.	Achieves 85% of identified needs and objectives.
F2	Benefit-to-cost ratio is 1.3.	Benefit-to-cost ratio is 1.1.	Benefit-to-cost ratio is 1.5.
F3	Undesirable social impacts expected.	No social impacts expected.	Beneficial social impacts expected.
F4	Decreases overall environmental quality by 20%. ^a	Decreases overall environmental quality by 15%. ^a	Decreases overall environmental quality by 10%. ^a

^aEnvironmental quality is reflected by joint consideration of air and water quality and available habitat quality and quality.

Numerical Synthesis

- ◆ Predefine Impacts
- ◆ Predefine Scale
- ◆ -5 to +5
- ◆ Evaluate Attributes

Impact Rating Criteria

CUMMINS CREEK PROJECT—AIR-QUALITY-IMPACT RATING CRITERIA	
Rating	Criteria
0	No potential negative impact.
1	The potential negative impacts, based on the level of emissions, would be insignificant.
2	The potential negative impacts, based on the level of emissions, would not be avoid, but would be handled by minimal controls.
3	The potential negative impacts, based on the level of emissions, would be significant but manageable.
4	The potential negative impacts, based on the level of emissions, would be serious and possibly unacceptable, but would be correctable.
5	The potential negative impacts, based on the level of emissions, would constitute a "total stop"—i.e., one that is not easily mitigable.

Source: Adapted from Wilson, 1981.

Impact Rating Criteria

CUMMINS CREEK PROJECT—ECOLOGICAL-IMPACT RATING CRITERIA	
Rating	Criteria
0	No potential negative impact to important species or habitats; no existing habitats (vegetation and/or soils) poor in quality and diversity or severely damaged.
1	The potential negative impact to important species or habitats would be minimal.
2	The potential negative impact to important species or habitats would be limited.
3	The potential negative impact to important species or habitats would be substantial.
4	The potential negative impact to important species or habitats would be only marginally acceptable.
5	The potential negative impact to important species or habitats would be excessive and unacceptable. Site is within an area containing critical habitat for endangered or threatened species.

Impact Rating Criteria

DUMMINS CREEK PROJECT—LAND-USE AND AESTHETICS-IMPACT RATING CRITERIA	
Rating	Criteria
0	No impact, no conflict with known existing or proposed land use. No alteration from assigned visual resource management classification. Project not visible from public access road.
1	Minimal impact, minimal conflict with known existing or proposed land use. Minimal alteration from assigned visual resource management classification. Minimal disturbance of existing view from public access road.
2	Limited impact, limited conflict with known existing or proposed land use. Limited alteration from assigned visual resource management classification. Limited disturbance of existing view from public access road.
3	Moderate impact, moderate conflict with existing or proposed land use. Moderate alteration from assigned visual resource management classification. Moderate disturbance of existing view from public access road.
4	Significant impact, significant conflict with known existing or proposed land use. The deviation from assigned visual resource management classification would be marginally acceptable. Project is highly visible from public access road. Considered marginally acceptable.
5	Major impact, major conflict with known existing or proposed land use. The deviation from assigned visual resource management classification would be excessive and unacceptable. Project is highly visible from public access road. Considered unacceptable. Land-use and aesthetics concerns constitute "a show stop" to project development.

Source: Archived from Internet, 10/21/01

Ranking - Nominal Group Process

- ◆ Interactive Group Technique
- ◆ Steps of Process
 - Independent Writing of Ideas
 - Round-Robin Listing
 - Group Discussion
 - Independent Voting on Priorities
 - Group Decision Based on Voting

Rating – Predefined Importance Scale

Scale reference*	Definition
1. Very important	A most relevant point First-order priority Has direct bearing on major issue Must be resolved, dealt with, or treated
2. Important	Is relevant to the issue Second-order priority Significant impact, but not until other issues are treated Does not have to be fully resolved
3. Moderately important	May be relevant to the issue Third-order priority May have impact May be a determining factor to major issue
4. Unimportant	Insignificantly relevant Low priority Has little impact Not a determining factor to major issue
5. Most unimportant	No priority No relevance No measurable effect Should be dropped as an item to consider

*Could use numbers or letter codes in the application; the pertinent reference for the assigned importance weight should be specified in the group notes, one to several decision factors, or possibly no decision factors, could be assigned to each scale reference.
Source: Linderoth and Turell, 1976, p. 137

Paired Comparison

- ◆ Importance Weight Assignment
 - Factor Importance Coefficient (FIC)
- ◆ Alternative Pairing
 - Alternative Choice Coefficient (ACC)
- ◆ Product Matrix = FIC x ACC
- ◆ Total Score

Data for Pair Comparison

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Importance Weight Assignment

Factor	Assignment of weight ^a	Sum	FIC
F1	1 1 1 1	4	0.40
F2	0 1 0 1	2	0.20
F3	0 0 0 1	1	0.10
F4	0 1 1 1	3	0.30
F5 (dummy)	0 0 0 0	0	0
Total		10	1.00

^aIt is vitally important that the rationale basic to each assignment be documented.

Delphi Approach

- ◆ **Interactive Technique**
- ◆ **Expertise in Field**
- ◆ **Steps of Process**
 - Factor Identification Based on Collective Professional Judgment
 - Relative-Importance Weighting
 - Group Decision Based on Voting

Public Involvement

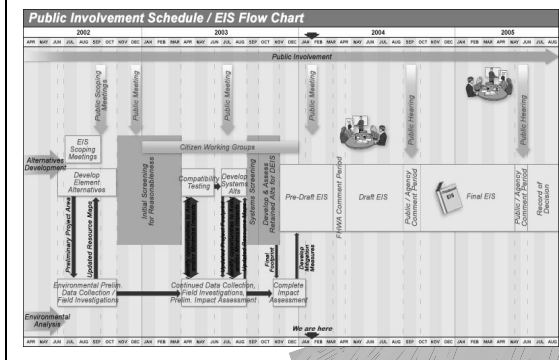
Role of Public

- ◆ **NEPA's success depends of public disclosure and review**
- ◆ **NEPA requires invitation of public review and comment**
 - Scoping
 - Draft EIS/EA
 - Public hearings
- ◆ **Public Enforce NEPA**
 - Involvement
 - Administrative Appeals
 - Litigation

Public Participation

- ◆ **Regulatory Requirement (CEQ Regs)**
 - Scoping
 - General Public-Involvement
 - Review of Draft EIS
- ◆ **Public Participation ? Public Relations**
- ◆ **Objectives of Public Participation:**
 - Information Dissemination
 - Identification of Problems
 - Idea Generation/Problem Solving
 - Evaluation of Alternatives
 - Conflict Resolution by Consensus

Points of Public Involvement



Advantages/Disadvantages

- ◆ **Advantages**
 - Exchange Information
 - Source of Information on Local Views
 - Aid in Establishing Credibility of Process
- ◆ **Disadvantages**
 - Confusion (many new perspectives)
 - Erroneous Information
 - Uncertainty of Results of Process
 - Delay

Levels of Public Participation

Awareness	Involvement	Participation
Monologue	Dialogue	Empowerment
Altering	Interaction	Planning
One-way	Two-way	Partnership
"Tokenism"	Engagement	Citizen Control
"Manipulation"	Consultation	
Therapy		

Levels of Citizen Involvement



Types of Publics

- ◆ Persons Immediately Affected
- ◆ Ecologist
- ◆ Business and Commercial Developers
- ◆ General Public

Techniques of Public Involvement

PUBLIC PARTICIPATION TECHNIQUES CLASSIFIED BY FUNCTION

1. Information dissemination	Citizen representatives on policy-making boards
Public information programs	"Fishbowl" planning
Drop-in centers	Interactive cable TV-based participation
Hot lines	Meetings—neighborhood
Meetings—open information	Neighborhood planning councils
2. Information collection	Policy capturing
Surveys	Value analysis
Focused group discussions	5. Decision making
Delphi-based techniques	Arbitration and medative planning
Community-sponsored meetings	Citizen referendum
Public hearings	Citizen review board
Ombudsman activities	Media-based issue balancing
3. Initiative planning	6. Participation process support
Advocacy planning	Citizen employment
Charrettes	Citizen honoraria
Community planning centers	Citizen training
Computer-based techniques	Community technical assistance
Design-in and color mapping	Coordinator or coordinator-catalyst
Plural planning	Game simulation
Task forces	Group dynamics
Workshops	
4. Reactive planning	
Citizens' advisory committees	

Effectiveness of Techniques

EFFECTIVENESS OF DIFFERENT COMMUNICATION TECHNIQUES ON VARIOUS "PUBLICS"

Public	Public hearings and meetings	Hot lines	Home programs and mailings	TV programs and films	Workshop activities	Delphi techniques	Direct mail and correspondence	Mobile phone sites	Interactive participation	Facilitators
Individual Citizens	H	L	H	H	H	L	L	H	M	L
Spontaneous Groups	H	M	M	M	M	H	H	H	H	M
Conservation/Environment Groups	H	M	M	M	M	H	H	H	H	M
Religious Organizations	M	M	M	H	H	H	H	M	M	H
Property Owners and Users	M	L	H	H	H	L	L	M	M	L
Business-Industrial	L	L	M	H	M	M	H	M	M	L
Professional Groups and Organizations	L	L	M	H	M	M	H	M	M	L
Educational Institutions	M	L	L	L	M	M	H	M	M	M
Service Clubs and Civic Organizations	L	L	H	M	M	M	L	H	H	M
Labor Unions	L	L	M	M	M	L	L	M	M	L
State-Local Agencies	H	M	L	L	L	M	H	H	H	H
State-Local Elected Officials	H	M	L	L	L	L	H	H	H	H
Federal Agencies	H	M	L	L	L	L	H	M	M	M
Other Groups and Organizations	H	M	M	M	M	M	H	H	H	M

Problems in Implementing Programs

- ◆ Coordination Between Agencies
- ◆ Control
- ◆ Representativeness
- ◆ Dissonance

Practical Considerations for Implementation

- ◆ Coordination between federal/state/local agencies
- ◆ Delineate objectives of Public Participation Program
- ◆ Identify publics (develop a mailing list)
- ◆ Select Public Participation techniques
- ◆ Develop Public Participation Program Plan
 - Elements of Program
 - Schedule of Program
 - Responsibilities

Elements of a Public Participation Program

- ◆ Disseminate Information
 - News Media – newspapers, radio, television
 - Newsletters – regularly scheduled publication
 - Informational Meetings – meet the expert
- ◆ Formal Public Meetings
 - Notice of Availability
 - Publicize Meeting (newspapers, radio, television)
 - Sufficient Room in Meeting Hall
 - Hand-Out Materials
 - Registration – sign in to speak
 - Agenda
 - Open Remarks – Purpose, Ground Rules, Review Project
 - Public Officials
 - General Public
 - Transcript or Notes

Causes of Environmental Conflicts

- ◆ Different Understanding of Facts
- ◆ Different Values
- ◆ Different Interests

Conflict Resolution

- ◆ **Conditions Required:**
 - Motivation Towards Resolution
 - Roughly Equals Power
 - Acceptable, Minimal Risk of Failure
 - Organizational Authority
 - Negotiability of Issues
 - Control of Process
 - Focus Must Be Problem-Solving
 - Focus of Interests of Parties

Impartial Third-Party Intervention

- ◆ **Roles:**
 - Create Climate of Trust
 - Ensure Fair and Adequate Representation
 - Brings Experts When Needed
 - Break Deadlock (setting goals/deadlines)
 - Suggest Solutions
 - Outlines Implementation Plans
- ◆ **Strategy:**
 - Areas of Agreement
 - Areas of Disagreement
 - Conflict-Resolution Procedure
 - Issue-by-Issue Negotiation

Lessons Learned From Conflict Resolution

- ◆ People bargain as long as positive outcome is possible
- ◆ Issues must be apparent
- ◆ Parties must be willing to address issues
- ◆ Success depends on having enough issues to trade off
- ◆ Agreement is unlikely if parties must compromise fundamental values
- ◆ Limit number of participants
- ◆ Pressure of deadline must be present

Practical Management of NEPA Projects

Constraints of NEPA Projects

- ◆ Results
- ◆ Budget
- ◆ Time

NEPA Project Life Cycle

- ◆ Initiation
- ◆ Develop Detailed Plan
- ◆ Execution of Plan
- ◆ Produce Deliverables
- ◆ Final Approval

NEPA Project Initiation

- ◆ **Conceptualize Project**
 - Establish Project Objectives
 - Establish Deliverables
 - Estimate Costs
 - Estimate Schedule
- ◆ **Obtain Project Authorization**

Develop Detailed Plan of Project

- ◆ Describe Objectives
- ◆ Describe Scope
- ◆ Define and Sequence Activities
- ◆ Estimate Duration and Resources
- ◆ Develop Schedule
- ◆ Develop Budget
- ◆ Develop Formal Quality Plan
- ◆ Develop Formal Communication Plan

Executing the Project

- ◆ Organize and Acquire Staff
- ◆ Periodically Summarize Results
- ◆ Identify Changes in Scope
- ◆ Identify Changes in Schedule
- ◆ Identify Changes in Budget

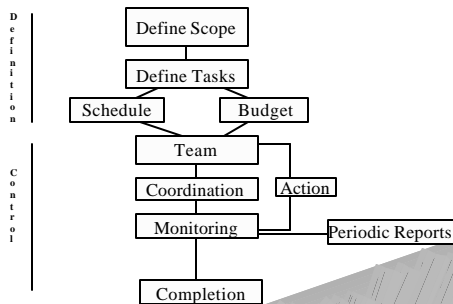
Produce Deliverables

- ◆ Create Prototypes
- ◆ Create Partial Deliverables
- ◆ Complete Integrated Deliverables
- ◆ Obtain Approval of Deliverables

Finishing the Project

- ◆ Scope Verification
- ◆ Formal Acceptance of Deliverable
- ◆ Formal Acceptance of Project
- ◆ Administrative Closure
- ◆ Plan for Follow-up

Project Management Activities



Define Scope of NEPA Project

- ◆ Specific Project Objectives
- ◆ Secondary Project Objectives
- ◆ Project Outcome
- ◆ Clarify Assumptions
- ◆ Document Decisions

Define Tasks

- ◆ Breakdown Project into Phases
- ◆ Visualize All Tasks by Phase
- ◆ Breakdown Tasks into Subtasks
- ◆ Sequence Activities
 - Network
 - Critical Path Method (CPM)
 - Program Evaluation and Review Technique (PERT)

Tasks in a NEPA Project

1. Identify project objectives
 - meet for action
 - determine objectives
 - identify alternatives
 - determine/provide/obtain information
2. Identify subfunctions needed for action
 - determine if necessary to budget to proceed; determine procedures if possible
 - determine and identify major approval of specific parts of the action; determine, identify & obtain necessary action (i.e. they be obtained by interagency best available agreement, etc.)
3. Scoping
 - 3.1. Develop scoping/consultation list
 - identify agencies
 - identify agencies & federal entities
 - obtain & determine project goals
 - contact parties who might have a stake
 - 3.2. Prepare information package
 - identify potential action & alternatives
 - identify potential environmental impacts
 - identify proposed scope of work
 - 3.3. Early involvement studies & other resources
 - public review of EIS or Federal Register
 - use existing and information package to inform government and agency staff
 - have information package available to public at designated location
4. Develop and conduct meetings
 - conduct meetings to obtain feedback/evaluate & as announced in terms to resolve all concerns
5. Develop EIS implementation strategy
 - determine the schedule
 - develop EIS/EA documents
 - development of other NEPA & other laws (e.g., resource conservation, etc.)
 - development of other tasks & data acquisition
 - identify issues & data requirements
 - preliminary assessment of alternatives for public review
 - identify issues & data requirements (e.g., information, etc.)
 - identify issues & data requirements (e.g., information, etc.)
 - plan to manage public participation & to respond to public comments

Tasks in a NEPA Project

- C. Draft EIS (EIS) Preparation
 8. Prepare EIS Implementation Plan
 - audit implementation structure (EIS)
 - budget & schedule
 - responsibilities for preparation
 - sign EIS
 9. Prepare copies EIS (Prepare schedule per EIS)
 10. Consult with internal agency review procedures
 11. Prepare EIS
 - Publish notice and public comments
 - public hearing
 - availability of public plans
 - public scheduling of public meetings
 12. Obtain comments
 - correspondence
 - public meeting comments
 - coordination meetings with government agencies
 14. Respond to comments
 - write EIS report (use WHO statements)
 - integrate & adjust mitigation measures
 - prepare written record of response to comments
 - D. Final EIS
 15. Publish final EIS (Prepare schedule per new EIS)
 16. Consult with internal agency review procedures
 17. Distribute final EIS to study community
 18. Receive & transmit comments on final EIS
 - E. Record of Decision (ROD)
 19. Prepare ROD EIS
 20. Follow internal agency review procedures
 21. Prepare ROD or Finding Report
- Source: National Research and Scientific, EIS, at 100-100

Develop Schedule

- ◆ Use Project Task Sequence
 - Dependent Tasks
 - Independent Tasks
- ◆ Plan Start Dates
- ◆ Estimate Duration of Each Task
- ◆ Meet with Team
- ◆ Modify Schedule to Achieve Completion Date
- ◆ Prepare Gantt Chart

Prepare Budget

- ◆ Prepare Budget by Phase and Task
- ◆ Preliminary Labor Estimate
- ◆ Materials/Travel
- ◆ Overhead
- ◆ Consult with Team
- ◆ Modify Budget
- ◆ Prepare Budget

Coordination

- ◆ Provides Critical Links - team, information
- ◆ List of Team Members - e-mail/fax/phone
- ◆ Inform Other Managers - before/during project
- ◆ Meet with Team Member
 - Review Schedule
 - Review Budget
- ◆ Resolve Conflicts - other priorities
- ◆ Relay Exactly What is Expected

Monitoring

- ◆ Develop Quality Plan
 - Define Standards of Performance
 - Schedule
- ◆ Review On-Going Work
- ◆ Review Budget
- ◆ Review Schedule
- ◆ Identify Conflict Between Team Members
- ◆ Solve Problems as They Arise

Periodic Reporting

- ◆ To Team
 - Key Phases of Project
- ◆ To Management
 - Regularly with Accurate Information
 - Include Bad News with Solutions
- ◆ To Client
 - Regularly
 - Warn of Bad News Before It Happens

Supporting Documentation

- ◆ All Team Members Need It
 - Sequence of Phases and Tasks
 - Schedule
- ◆ Narrative Instructions
- ◆ Change in Schedule/Budget
- ◆ Change in Scope
